

What is claimed is:

- 1 1. A semiconductor processing apparatus comprising:
2 a process chamber having a support, a process gas distributor, and an exhaust; and
3 a continuously variable air flow responsive to temperatures changes in the dome
4 chamber, such that dome temperature is stabilized in accordance with a preset
5 temperature during a semiconductor manufacturing process.
- 1 2. The semiconductor processing apparatus in Claim 1 further comprising:
2 a plasma reactor chamber having an antenna driven by RF energy inductively coupled
3 inside the dome.
- 1 3. The semiconductor processing apparatus in Claim 2 further comprising:
2 a low energy plasma generated by the antenna for etching metals, dielectrics and
3 semiconductor materials.
- 1 4. The semiconductor processing apparatus in Claim 2 further comprising:
2 an auxiliary RF bias energy applied to the wafer support cathode to control the cathode
3 sheath voltage and the ion energy independent of density.
- 1 5. The semiconductor processing apparatus in Claim 1 further comprising:
2 a semiconductor manufacturing idle process.
- 1 6. A method for providing uniform temperature gradients in a semiconductor processor
2 for substrate processing comprising the steps of:
3 providing a continuous flow of air utilizing a flow switch wherein the flow switch
4 chooses between two discrete air flows, a first air flow to provide a temperature change
5 during processing and a second air flow to provide a temperature change during process
6 idle.

1 7. The method for providing uniform temperature gradients in a semiconductor processor
2 for substrate processing in Claim 5 further comprising the steps of: regulating the flow of
3 air utilizing a flow switch to provide cooling of the two discrete air flows.

1 8. The method for providing uniform temperature gradients in a semiconductor processor
2 for substrate processing in Claim 5 further comprising the steps of: predefining the
3 temperature as a result of the chosen air flow.

1 9. A method for providing a continuous flow of air in a semiconductor processor for
2 substrate processing comprising the steps of: sensing selected temperature points of
3 measurement and maintaining an air flow proportional to a range of temperatures at
4 selected temperature points and; maintaining a selected temperature during the time that
5 processor is processing substrates and a when processing substrates is idle.

1 10. The method for providing uniform temperature gradients in a semiconductor
2 processor for substrate processing in Claim 8 further comprising the steps of: maintaining
3 a supply of heat comprising the air flow at a predefined temperature.

1 11. The method for providing uniform temperature gradients in a semiconductor
2 processor for substrate processing in Claim 8 further comprising the steps of: utilizing a
3 heat exchanger to regulate the amount of heat provided to the chamber surface.

1 12. The method for providing uniform temperature gradients in a semiconductor
2 processor for substrate processing in Claim 9 further comprising the steps of: utilizing
3 one or more temperature sensors and a flow controller for allowing upward and
4 downward fluctuations in the temperature of the dome.

1 13. The method for providing uniform temperature gradients in a semiconductor
2 processor for substrate processing in Claim 9 further comprising the steps of: utilizing

3 one or more temperature sensors and a flow controller for allowing upward and
4 downward fluctuations in the heat provided to the dome.

1 14. The method for providing heat to a semiconductor processor for substrate processing
2 in Claim 8 further comprising the steps of: maintaining a supply of air comprising the air
3 flow at a predefined quantity of heat provided to the dome.